

Chapter 2

Operating System Structures

OS Services

- User Interface
- Program Execution
- I/O Operation
- File System manipulation
- Communication
- Error detection

- Resource Allocation
- Accounting
- Protection/Security

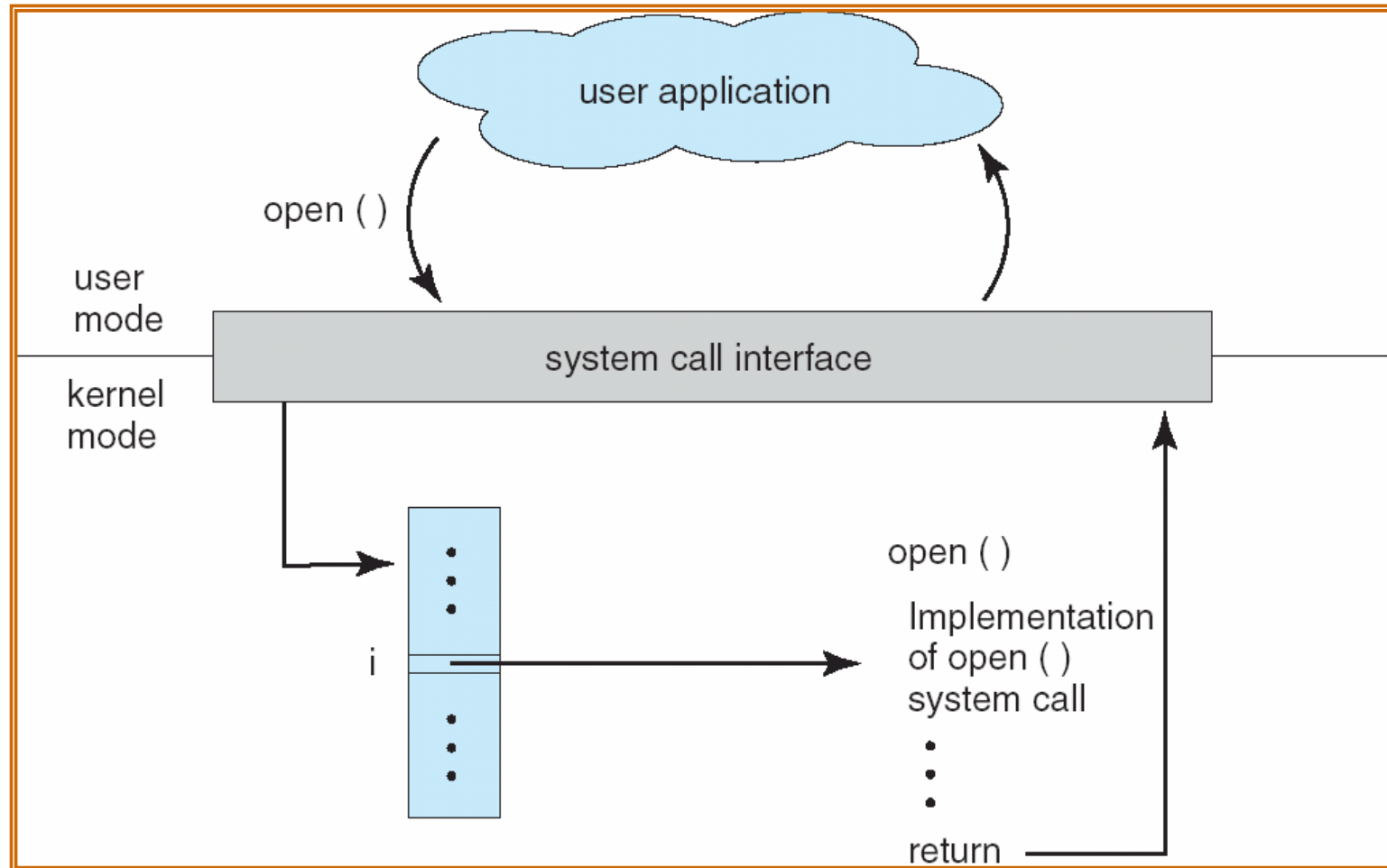
User Interface to the OS

- Command Interpreter
 - Command line
 - Unix Shell
 - C:\
 - Mac Terminal

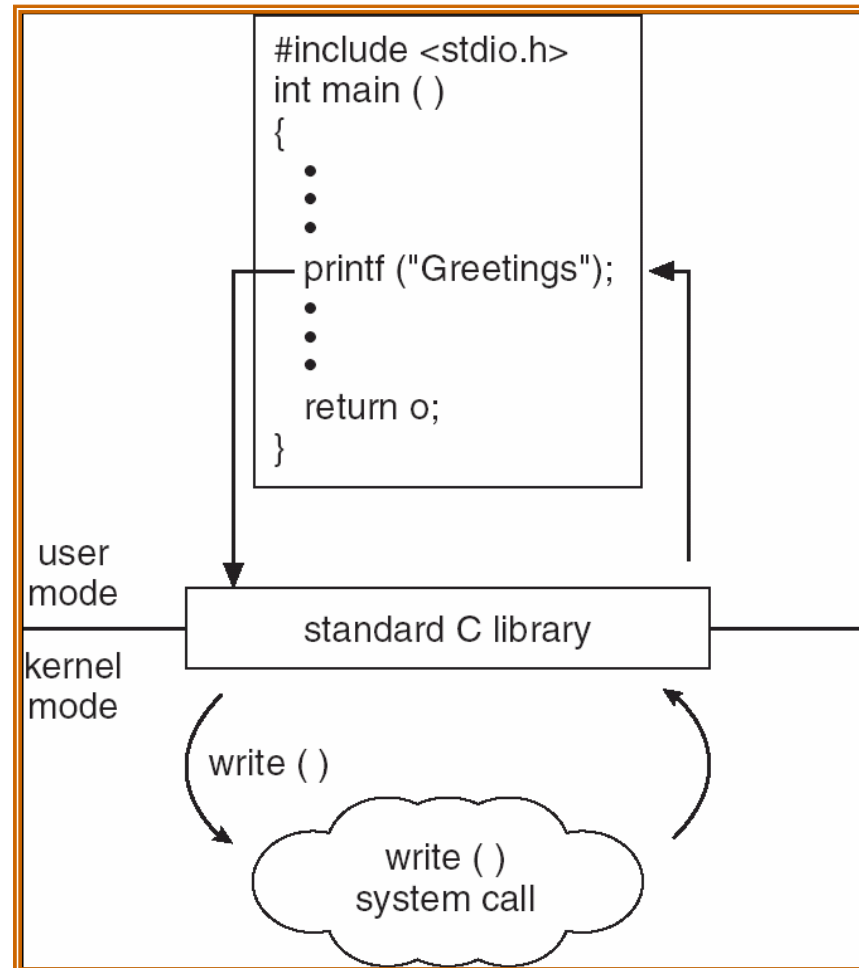
- GUI
 - Xerox PARC
 - Mac OS
 - Windows
 - X-Windows
 - KDE/GNOME

System Calls

- Interface to OS (kernel) services
- Wrapped in API (API = ?)
 - POSIX
libc.so
libgcc.so
 - Win32
 - Java API
 - why?



System Call via Library



Systems Calls: Data

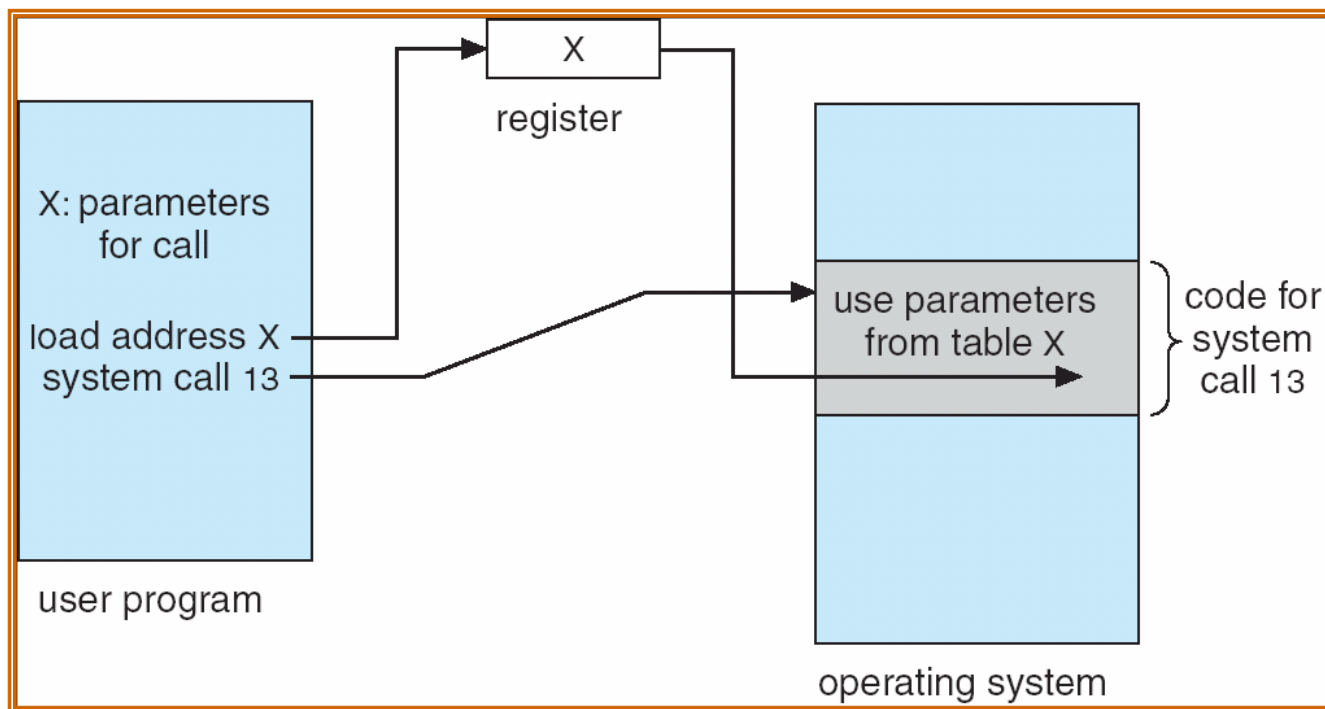
- Passing data to a system call

- Registers

- Block of memory

- Stack

- Advantages/
Disadvantages?



Types of System Calls

- Process Control
 - How does GDB work?
- File access
- Device access
- Information maintenance
- Communications

Process Control

- What are some process control system calls?
 -
 -
 -
 -
- How does GDB work?
 - the ptrace API
 - what does GDB need to do?

Even More....

- Information Maintenance
 - Date
 - Time
- Communication
 - Message passing
 - pipes
 - Shared memory
 - Networking

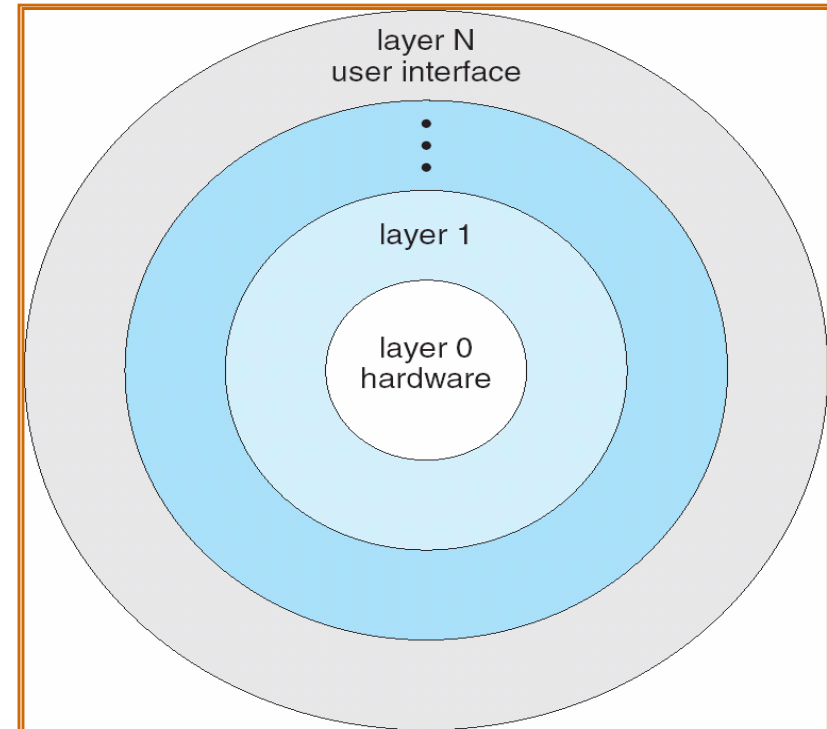
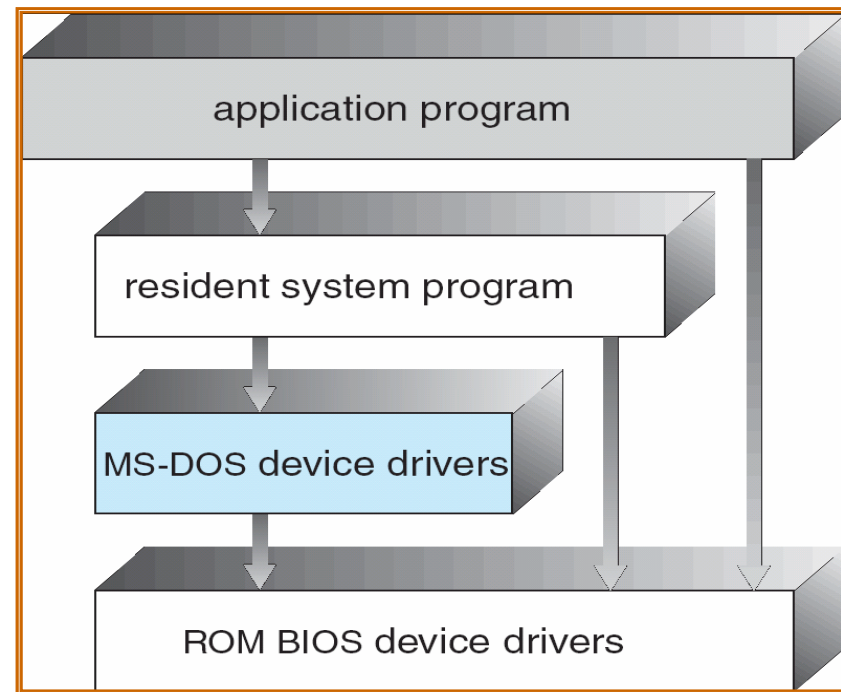
Operating System Design

- Design Goals
- Mechanism vs Policies
- Implementations
 - Assembly vs C
 - advantages/disadvantages?

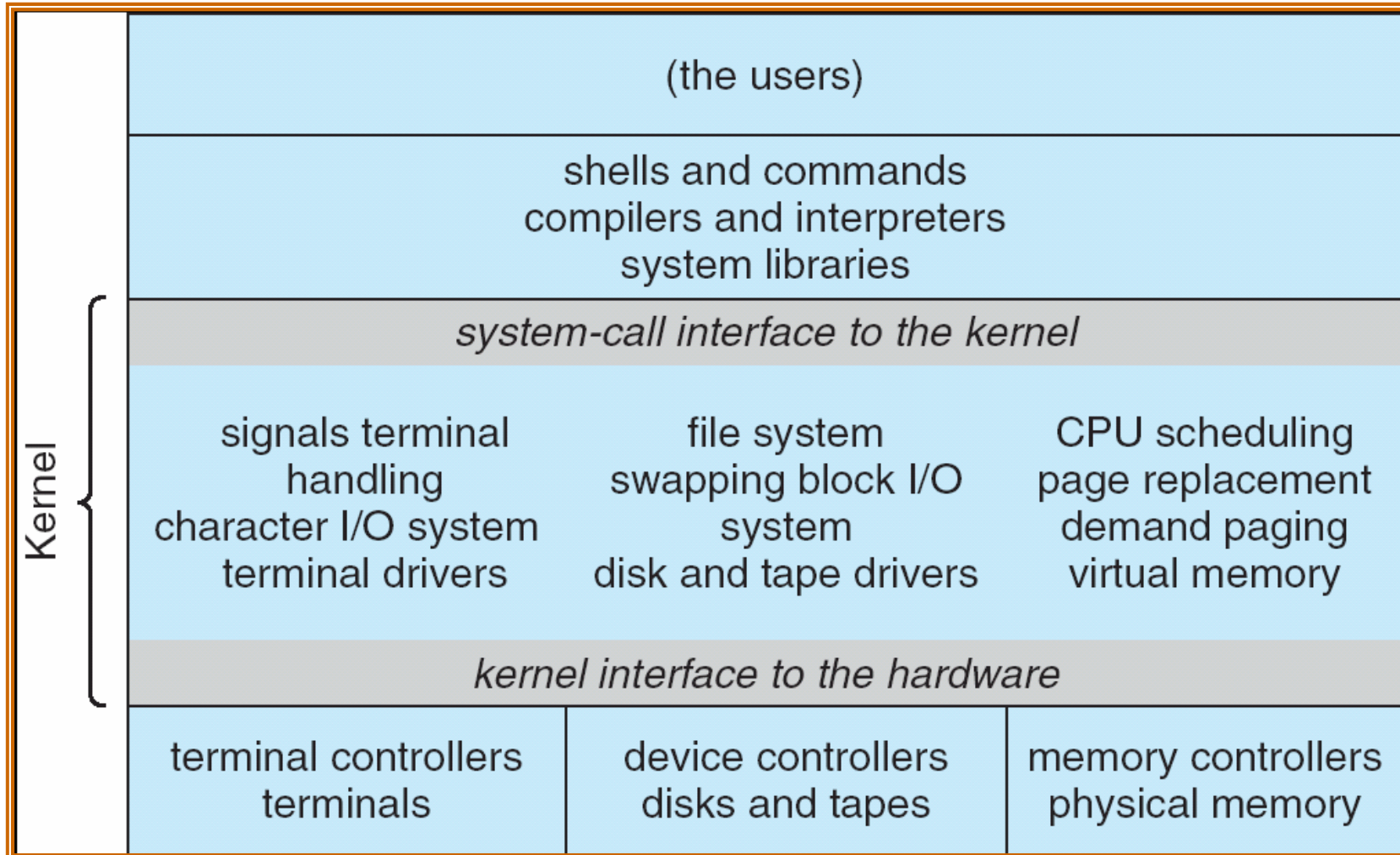
OS Structure

- Simple
 - MS DOS
 - Monolithic

- Layered



Old Unix

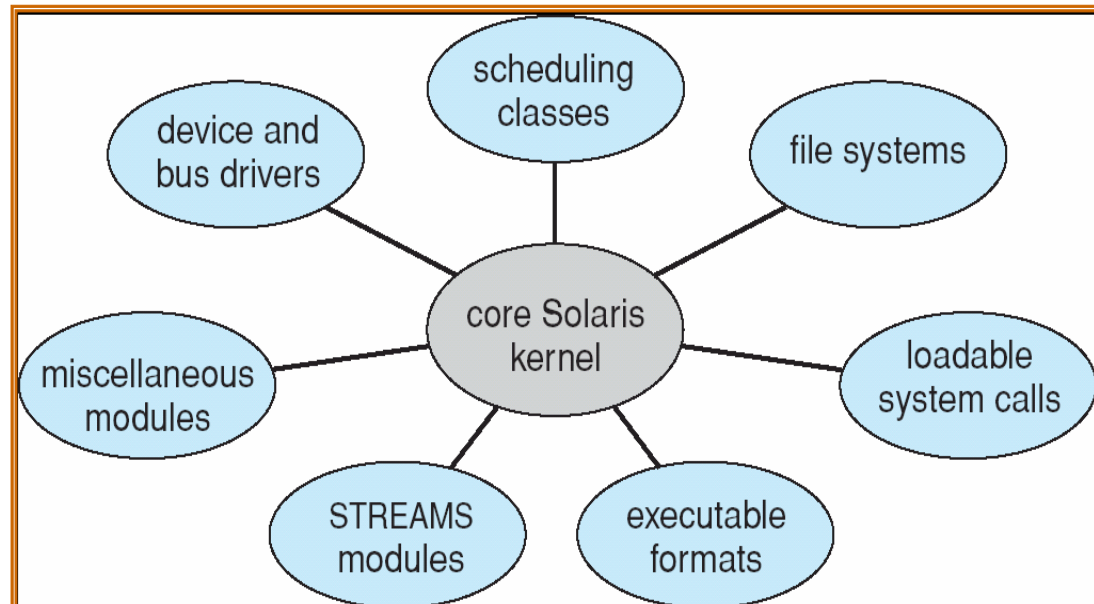


- Really Big Layers

Structure

- Microkernel
 - Mach/MacOS

- Modular
 - Modern Linux/Unix



Virtual Machines (VM)

- Abstract away the hardware
 - Real or imagined hardware
 - Parallels
 - VMWare/Bochs
 - Java VM

